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(54) **ENDOSCOPIC SURGICAL CLIP APPLIER INCLUDING COUNTER ASSEMBLY**

(71) Applicant: **Covidien LP**, Mansfield, MA (US)

(72) Inventors: **Jacob C. Baril**, White Plains, NY (US); **Matthew A. Dinino**, Newington, CT (US)

(73) Assignee: **COVIDIEN LP**, Mansfield, MA (US)

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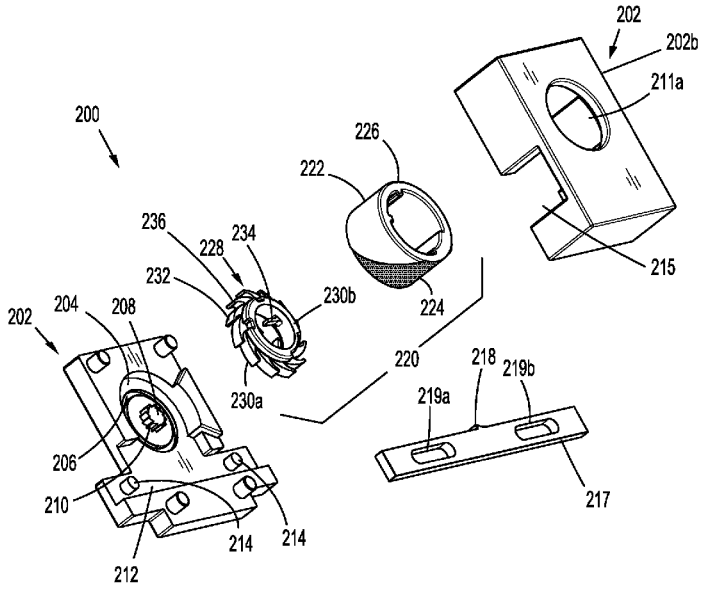
(57) **ABSTRACT**

A counter assembly includes a first housing half, a second housing half, a stationary post, a counting wheel, an actuation wheel, and an actuator. The stationary post is positioned within the first housing half and includes a plurality of locking teeth. The counting wheel includes indicia. The actuation wheel includes a plurality of actuation features and a plurality of inner fingers configured to selectively engage with the plurality of locking teeth of the stationary post. The engagement of the plurality of inner fingers and the plurality of locking teeth prohibit multidirectional rotation of the counting wheel. The actuator includes a protrusion projecting therefrom. The actuator is positioned to translate between a proximal position and a distal position. The protrusion of the actuator engages the plurality of actuation features to rotate the counting wheel to adjust the indicia thereof when the actuator transitions from the proximal position and the distal position.

18 Claims, 4 Drawing Sheets



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See application file for complete search history.

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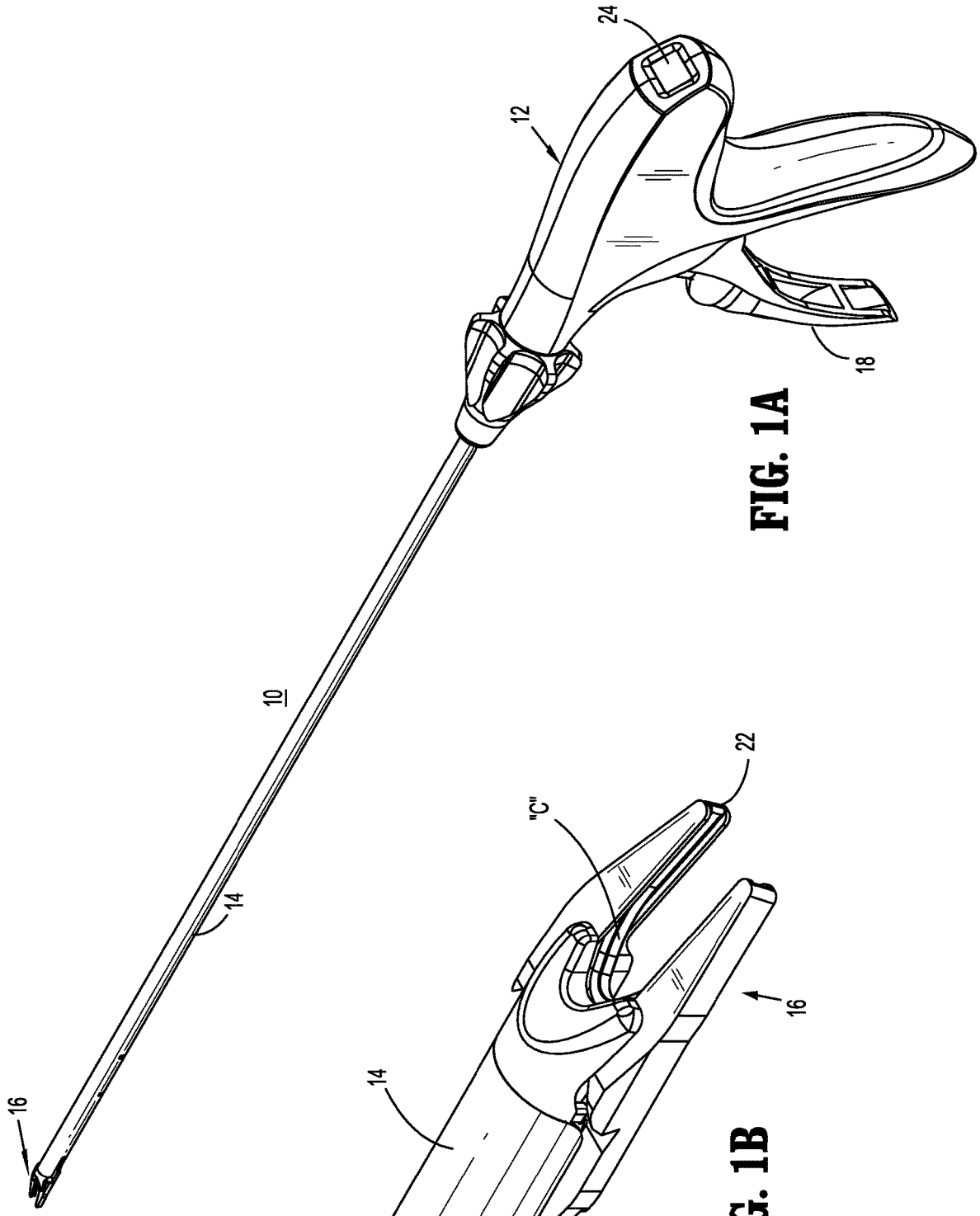

FIG. 1A

FIG. 1B

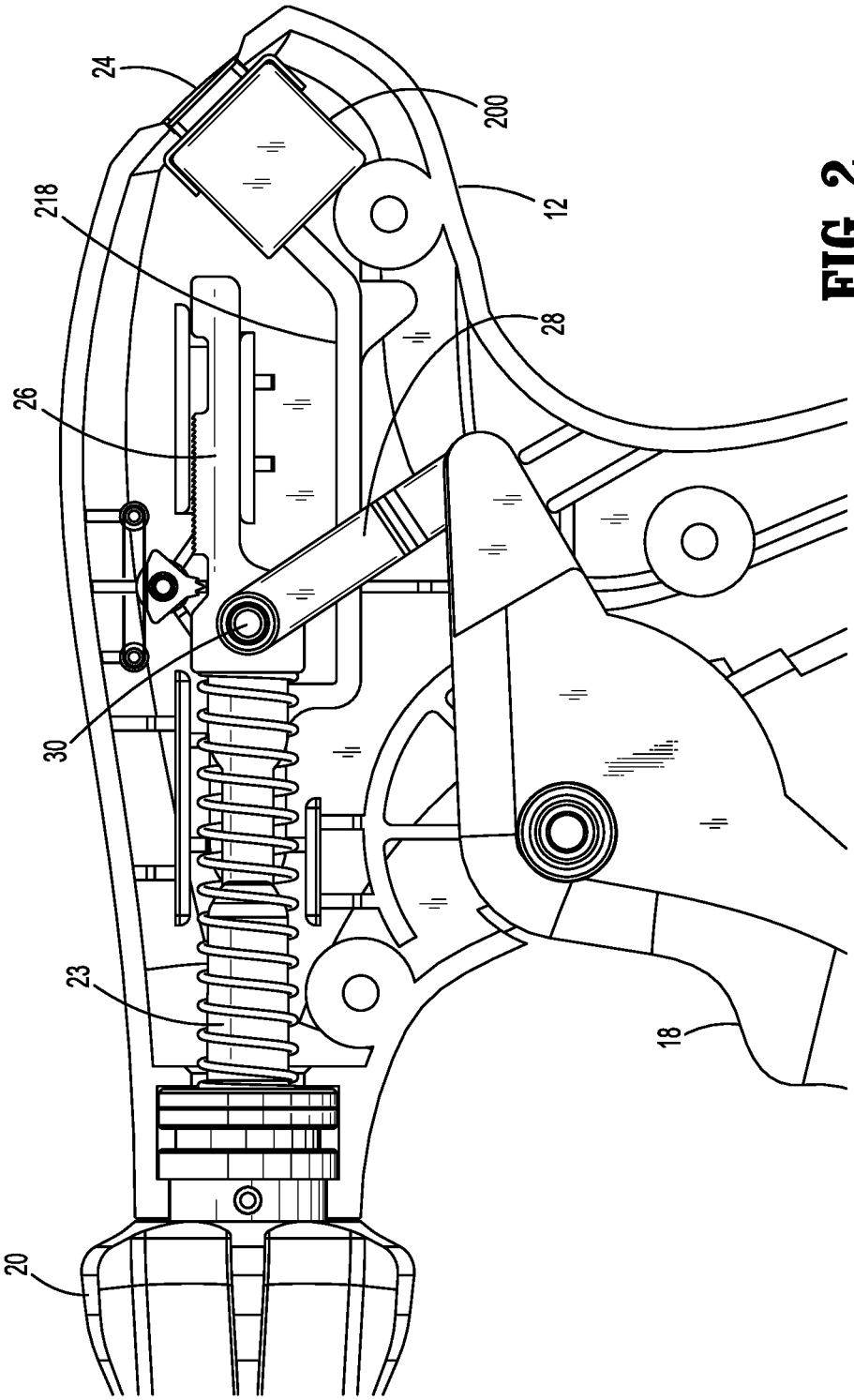

FIG. 2

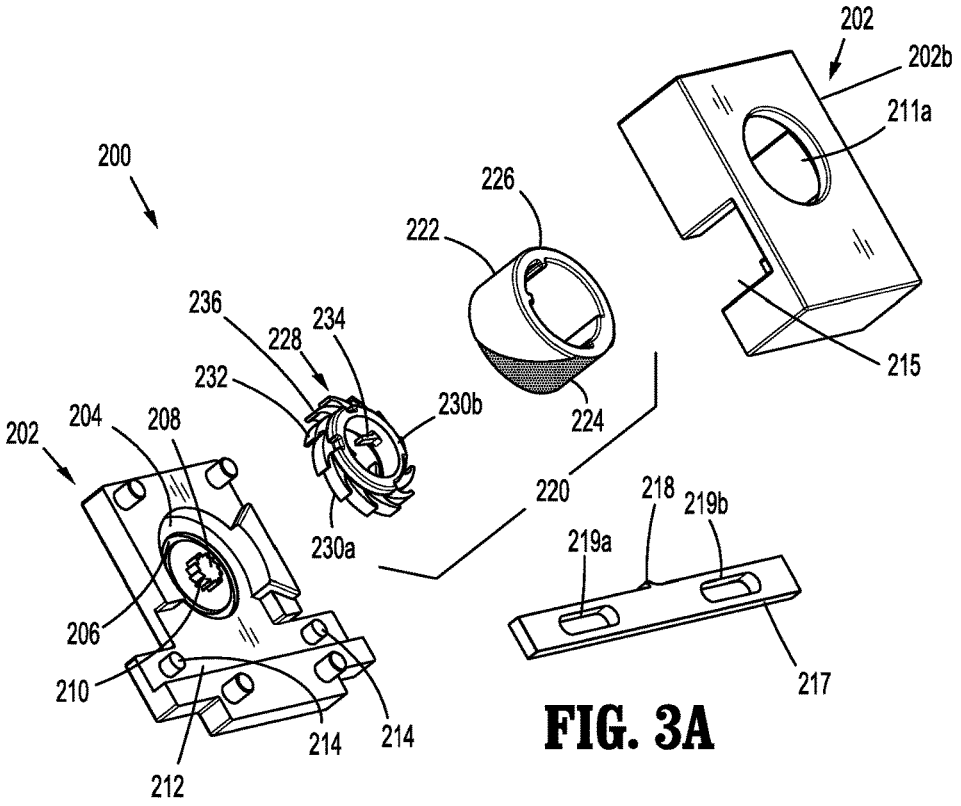

FIG. 3A

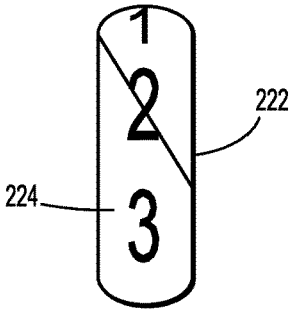

FIG. 3B

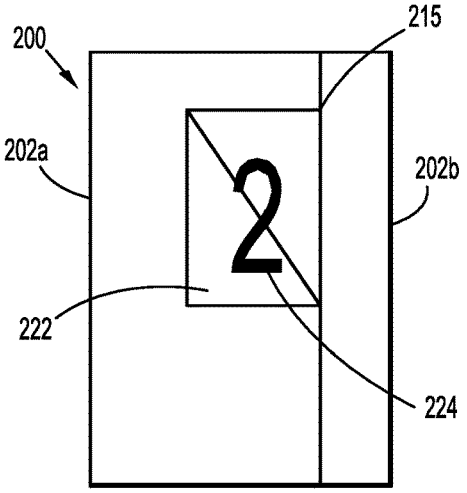

FIG. 3C

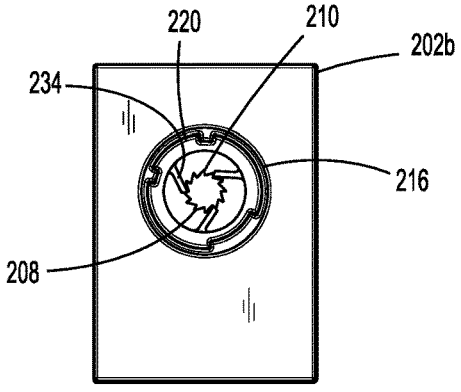

FIG. 3D

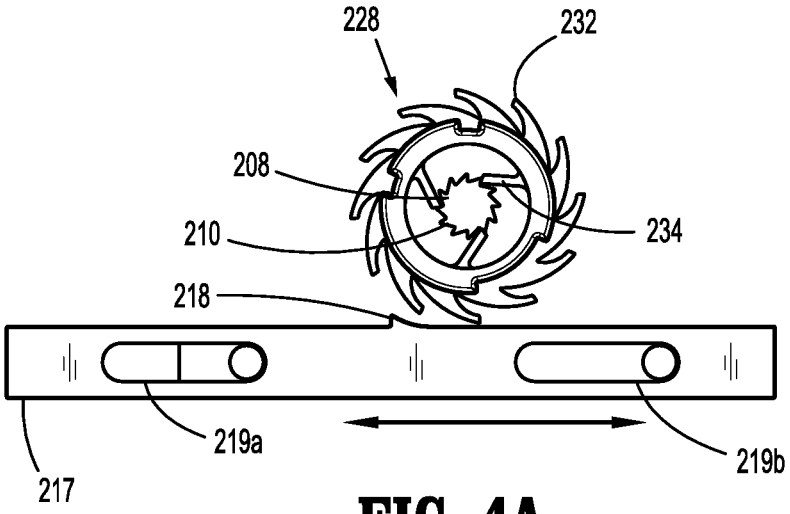
228
232
208
234
210
218
219a
219b
217

FIG. 4A

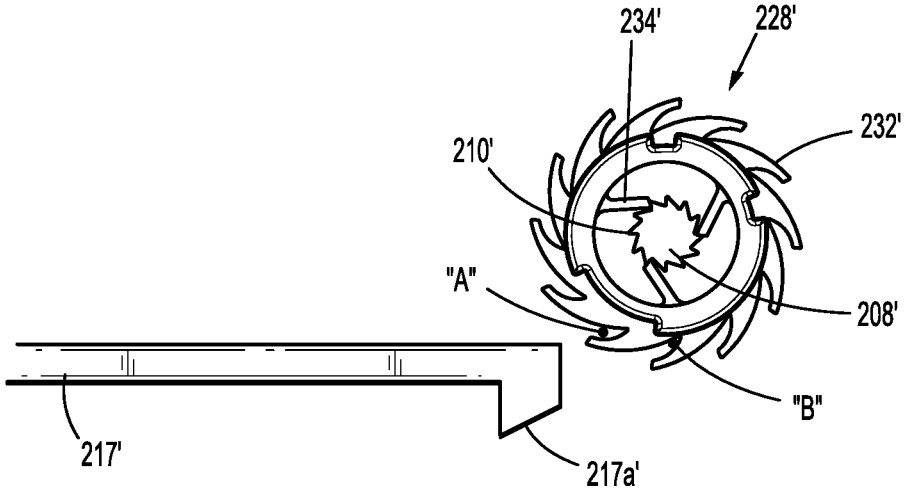
234'
228'
232'
210'
"A"
208'
"B"
217'
217a'

FIG. 4B

ENDOSCOPIC SURGICAL CLIP APPLIER INCLUDING COUNTER ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of and priority to U.S. Provisional Patent Application No. 62/527,103 filed Jun. 30, 2017, the entire disclosure of which is incorporated by reference herein.

BACKGROUND

Technical Field

The presented disclosure relates generally to surgical clip appliers. More particularly, the present disclosure relates to an endoscopic surgical clip applier having a counter assembly.

Discussion of Related Art

Surgical clip appliers offer surgeons an alternative to conventional suturing of body tissues and vessels. Surgical clip appliers generally store a plurality of clips which are fed sequentially to a jaw mechanism at the distal end of the instrument upon opening and closing of handles at the proximal end of the instrument. As the handles are closed, the jaw members close to deform a clip positioned between the jaw members, and as the jaw members are opened to release the deformed clip, a new clip is fed from the plurality of clips to a position between the jaw members. This process is repeated until all the clips in the plurality of clips have been used.

A need exists for a user of the clip applier to know how many clips remain in the clip applier and/or to know when a final clip of the plurality of clips has been fired.

SUMMARY

The presented disclosure relates to endoscopic surgical clip appliers having a counter assembly.

A surgical clip applier includes a handle assembly, an elongated tubular member, a rack bar, and a counter assembly. The elongated tubular member extends distally from the handle assembly. The counter assembly is supported in the handle assembly. The counter assembly includes a housing, a stationary post, a counting wheel, an actuation wheel, and an actuator. The housing includes a first housing half and a second housing half, wherein the stationary post is positioned within the first housing half and includes a plurality of locking teeth. The counting wheel is positioned to rotate within the housing and includes indicia visible through the handle assembly. The actuation wheel includes a plurality of actuation features and a plurality of inner fingers configured to selectively engage with the plurality of locking teeth of the stationary post. The engagement of the plurality of inner fingers of the actuation wheel and the plurality of locking teeth of the stationary post prohibit multidirectional rotation of the counting wheel. The actuator is supported on the rack bar for translation therewith. The actuator includes a protrusion projecting therefrom. The actuator is positioned to translate between a proximal position and a distal position. The protrusion of the actuator engages the plurality of actuation features to rotate the counting wheel to adjust the indicia of the counting wheel when the actuator transitions between the proximal position and the distal position.

The first housing half defines a linear channel and includes at least one translation pin positioned within the linear channel. The actuator is configured to translate within the linear channel of the first housing half and defines at least one channel configured to receive the at least one translation pin. The first housing half also defines a first recess and a second recess, wherein the first recess is configured to receive the actuation wheel and the counting wheel and the second recess is configured to receive a first side of the actuation wheel. The stationary post is concentrically positioned within the first housing half in relation to the first recess and the second recess. The second recess of the first housing half prevents disconnection between the plurality of inner fingers of the actuation wheel and the plurality of locking teeth of the stationary post. The second housing half also defines an aperture configured to receive the counting wheel.

The actuation wheel includes a plurality of protrusions and the counting wheel defines a plurality of grooves. The plurality of grooves is configured to receive the plurality of protrusions such that the actuation wheel and the counting wheel are coupled together.

Each inner finger of the plurality of inner fingers is resilient and flexible, and extends in a substantially tangential direction to an inner surface of the actuation wheel. The substantially tangential direction of each inner finger of the plurality of inner fingers prohibits the multidirectional rotation of the counting wheel.

Each actuation feature of the plurality of actuation features is resilient and flexible, and extends in a substantially tangential direction to an outer surface of the actuation wheel. In one embodiment, the plurality of actuation features is configured to flex away from the actuator when the actuator is translating from the distal position to the proximal position. In another embodiment, the plurality of actuation features is configured to flex away from the actuator when the actuator is translating from the proximal position to the distal position.

The surgical clip applier also includes a plurality of surgical clips disposed within the elongated tubular member. The indicia of the counting wheel indicate a remaining number of the plurality of surgical clips. The number of actuation features of the plurality of actuation features is equal to an initial number of surgical clips of the plurality of surgical clips. In one embodiment, the indicia include a plurality of numbers to indicate the remaining number of surgical clips of the plurality of surgical clips. In another embodiment, the indicia include a color to indicate the remaining number of surgical clips of the plurality of surgical clips. The housing defines a window therethrough which the indicia of the counting wheel are visible during the use of the surgical clip applier.

Other aspects, features, and advantages will be apparent from the description, the drawings, and the claims that follow.

BRIEF DESCRIPTION OF THE DRAWINGS

An illustrative embodiment of a surgical clip applier with a counter assembly is disclosed herein with reference to the drawings wherein;

FIG. **1**A is a perspective view of a surgical clip applier according to the present disclosure;

FIG. **1**B is an enlarged perspective view of a jaw structure of the surgical clip applier of FIG. **1**A;

FIG. **2** is a side view, with a half of a body removed, of a handle assembly of the surgical applier including a counter assembly;

FIGS. **3**A-**3**D are enlarged views of components of a counter assembly of the surgical clip applier of FIG. **1**A; and

FIGS. **4**A and **4**B are enlarged views of embodiments of an actuator of the surgical clip applier of FIG. **1**A.

DETAILED DESCRIPTION OF EMBODIMENTS

Embodiments of surgical clip appliers in accordance with the present disclosure will now be described in detail with reference to the drawings wherein like reference numerals identify similar or identical structural elements. As shown in the drawings and described throughout the following description, as is traditional when referring to relative positioning on a surgical instrument, the term "proximal" refers to the end of the apparatus which is closer to a user and the term "distal" refers to the end of the apparatus which is farther away from the user.

Referring now to FIGS. **1**A, **1**B, and **2**, surgical clip applier **10** generally includes a handle assembly **12** and an elongated tubular member **14** extending distally from handle assembly **12**. Handle assembly **12** may be formed of a plastic material while elongated tubular member **14** may be formed of stainless steel or other metals. A pair of jaws **16** is mounted on a distal end of elongated tubular member **14** and is actuated by a trigger **18** movably mounted in handle assembly **12**. The pair of jaws **16** defines a channel **22** for receipt of a surgical clip "C" therein. The pair of jaws **16** may be formed of stainless steel or titanium. A knob **20** is rotatably mounted on a distal end of handle assembly **12** and affixed to elongated tubular member **14** to provide 360 degree rotation of elongated tubular member **14** and the pair of jaws **16** about its longitudinal axis. A counter window **24** is provided in handle assembly **12** to view an indicator, such as, for example, a counter assembly associated with handle assembly **12**. Handle assembly **12** includes a longitudinally movable rack bar **26** (FIG. **2**) which is connected to trigger **18** by means of a wishbone link **28** (FIG. **2**). A pin **30** is provided to connect wishbone link **28** to rack bar **26** (FIG. **2**). Rack bar **26** is provided for advancing and crimping a surgical clip between jaws **16** in response to actuation of trigger **18**. Rack bar **26** is biased to a proximal position by a return spring **23** (FIG. **2**). A complete description of the inner-workings and operation of surgical clip applier can be found in U.S. Pat. No. 7,905,890, the entire content of which is hereby incorporated by reference herein.

Moving now to FIGS. **3**A-**3**D, a counter assembly **200**, for use in surgical clip applier **10**, is illustrated. Counter assembly **200** is configured to provide an indication of either the number of clips fired or the number of clips remaining within surgical clip applier **10**. Counter assembly **200** includes a housing **202**, an actuator **217**, and a counting mechanism **220**.

Housing **202** of counter assembly **200** includes a first housing half **202***a* and a second housing half **202***b*. First and second housing halves **202***a*, **202***b* may be snap fitted together or connected in any other appropriate method. When connected, first and second housing halves **202***a*, **202***b* define a window **215** therein which coincides with counter window **24** of handle assembly **12**. Additionally, housing **202** encases the other components of counter assembly **200**.

First housing half **202***a* of housing **202** defines a linear channel **212** which is configured and adapted for translation of actuator **217** between a proximal position and a distal position within counter assembly **200**. Translation pins **214** are positioned within linear channel **212**. Additionally, first housing half **202***a* further defines a first circular recess **204** therein, which is configured and adapted to rotationally support counting mechanism **220**. A second circular recess **206** is defined within first housing half **202***a*, which is configured and adapted to receive a first side **230***a* of actuation wheel **228** of counting mechanism **220**. Second circular recess **206** acts as a track for counting mechanism **220** by keeping counting mechanism **220** aligned within first circular recess **204**. Second circular recess **206** is concentric with first circular recess **204**, and a circumference of first circular recess **204** is larger than a circumference of second circular recess **206**. Additionally, the circumference of second circular recess **206** matches a circumference of first side **230***a* of actuation wheel **228** of counting mechanism **220**.

A stationary post **208** is concentrically positioned in both first and second circular recesses **204**, **206** of first housing half **202***a* and extends perpendicular therefrom. An outer circumference of stationary post **208** includes a plurality of locking teeth **210**, which allows the counting mechanism **220** to only transition/rotate in one direction upon engagement of actuator **217** therewith. The interaction between stationary post **208** and counting mechanism **220** will be discussed in further detail below.

Second housing half **202***b* of housing **202** defines an aperture **216** therein that is adapted and configured to fit counting mechanism **220**, thereby facilitating a connection of all of the components of counter assembly **200** (FIG. **3**D).

As specifically illustrated in FIG. **3**A, counting mechanism **220** includes a counting wheel **222** and an actuation wheel **228** including a plurality of actuation features **232** and a plurality of inner fingers **234** projecting therefrom. In some embodiments, counting wheel **222** is formed into a hollow cylinder including a plurality of inner grooves **226**. The plurality of inner grooves **226** is defined within an inner circumference of counting wheel **222**.

Additionally, counting wheel **222** includes indicia **224** positioned or displayed circumferentially thereabout (FIG. **3**D). Indicia **224** may take the form of digits, which indicate either the number of remaining surgical clips or the number of surgical clips that have been fired. Indicia **224** may take other forms, such as a color to indicate the number of surgical clips remaining. For example, the color red may indicate that a small number of surgical clips remain. Additionally, indicia **224** may include a combination of different indicia, such as alpha-numeric digits and colors. For example, as a number of indicia **224** of counting wheel **222** increases or decreases, a color of indicia **224** of counting wheel **222** may also change.

In embodiments, actuation wheel **228** includes a first side **230***a*, a second side **230***b*, a plurality of actuation features **232** positioned circumferentially thereabout, and a plurality of inner fingers **234** positioned about an inner circumference thereof. First side **230***a* of actuation wheel **228** is configured and adapted to fit within second circular recess **206** of first housing half **202***a* of housing **202**. Second side **230***b* of actuation wheel **228** includes a plurality of protrusions **236** configured and dimensioned to fit within the plurality of grooves **226** of counting wheel **222**.

The plurality of actuation features **232** of actuation wheel **228** may be positioned between first side **230***a* and second side **230***b*, such that the plurality of actuation features **232** does not directly abut an outer edge of either first or second sides **230***a*, **230***b*. As illustrated in FIG. **3**B, the plurality of actuation features **232** take the form of resilient, flexible fingers that all extend in a substantially tangential direction

to an outer surface of actuation wheel **228**. In some embodiments, the plurality of actuation features **232** take the form of teeth, which allow counting wheel **222** to only transition/rotate in one direction upon engagement with actuator **217**. Additionally, the number of actuation features **232** may be equivalent to the number of surgical clips of clip applier **10**.

As seen specifically in FIGS. **3**A and **3**D, a plurality of inner fingers **234** is positioned about inner circumference of actuation wheel **228**. Each finger **234** takes the form of a long protrusion which is positioned at an angle with respect to the inner circumference of actuation wheel **228**. Specifically, each finger **234** is resilient and flexible, and extends in a substantially tangential direction to an inner surface of actuation wheel **228**. Each finger **234** extends in a generally common tangential direction as the plurality of actuation features **232**. The angle and size of each inner finger **234** is such as to coincide with a profile of each locking tooth **210** of stationary post **208** of first housing half **202***a*, such that the positioning angle of each inner finger **234** allows actuation wheel **228** to transition/rotate in a first direct, but prohibits actuation wheel **228** to transition/rotate in a second direct, opposite the first direction.

In operation, as will be described in greater detailed below, during rotation of actuation wheel **228** in the first direct, each inner finger **234** flexes over the plurality of locking teeth **210** of stationary post **208** thereby allowing the actuation wheel **228** to transition/rotate in reaction to actuator **217**. After inner fingers **234** flex over the plurality of locking teeth **210**, each inner finger **234** is positioned within the valleys defined between the plurality of locking teeth **210** of stationary post **208** thereby prohibiting movement of actuation wheel **228** in a second direction, upon the return of actuator **217**.

Referring back to FIG. **3**A, a method of assembly of counter assembly **200** is illustrated. As mentioned above, all components of counter assembly **200** interconnect with one another. Actuator **217** is seated within linear channel **212** of first housing half **202***a* with translation pins **214** positioned within channels **219***a* and **219***b* of actuator **217**. First side **230***a* of actuation wheel **228** is seated within second circular recess **206** of first housing half **202***a* with stationary post **208** extending therethrough and with stationary post **208** engaging with the plurality of inner fingers **234** of actuation wheel **228**. The plurality of protrusions **236** defined about second side **230***b* of actuation wheel **228** fit within the plurality of inner grooves **226** defined about the inner circumference of counting wheel **222** thereby connecting counting wheel **222** with actuation wheel **228**. Counting wheel **222** is then seated within aperture **216** of second housing half **202***b*. First housing half **202***a* and second housing half **202***b* are then snap-fitted together thereby assembly all components of counter assembly **200**.

In an alternative embodiment, counter assembly **200** may not include housing **202**. In this embodiment, the remaining components of counter assembly **200** will be directly coupled to or formed in handle assembly **12** of surgical clip applier **10**, such that first circular recess **204**, second circular recess **206**, and stationary post **208** including the plurality of locking teeth **210** will be formed and defined within a first half of handle assembly **12** (not illustrated). A third circular recess (not illustrated), configured to receive the counting wheel **222** and permit rotation thereof, will be defined within a second half of handle assembly **12** (not illustrated). In this embodiment, each component engages with one another similarly or exactly how they engage with one another as described above.

Referring specifically to FIGS. **4**A and **4**B, embodiments of an actuator are illustrated. As illustrated in FIG. **4**A, actuator **217** may include two longitudinally extending channels **219***a* and **219***b* formed therein and a protrusion **218** extending therefrom. In this embodiment, protrusion **218** may take a triangular form (e.g., a tooth). Also, protrusion **218** may be axially centrally located upon actuator **217**. Channels **219***a* and **219***b* are configured and dimensioned to receive translation pins **214** of linear channel **212** of first housing half **202***a*. Translation pins **214** and channels **219***a*, **219***b* are configured to permit linear translation of actuator **217**. In operation, actuator **217** translates in a distal direction, for example, a first direction, actuator **217** translates linearly causing protrusion **218** thereof to engage with one actuation feature **232** of actuation wheel **228** thereby causing counting wheel **222** to rotate. When actuator **217** translates in a proximal direction, for example, a second direction, protrusion **218** engages with at least one actuation features **232** thereby causing that at least one actuation feature **232** to flex. The flexing of the at least one actuation feature **232** inhibits counting wheel **222** from translating/rotating in a direction opposite than the first direction, for example, the desired direction.

With reference to FIGS. **2** and **4**A, rack bar **26** is biased to a proximal position by a return spring **23** of clip applier **10**, such that actuator **217** is also biased to a proximal position. The actuation of trigger **18** causes rack bar **26** to translate from the proximal position to a distal position. Upon release of trigger **18**, rack bar **26** translates from the distal position back to the proximal position. Given that actuator **217** is coupled to rack bar **26**, actuator **217** also translates between the proximal position and the distal position in response to the actuation and release of trigger **18**. In this embodiment, when actuator **217** translates from the proximal position to the distal position, protrusion **218** engages one of actuation features **232** of actuation wheel **228** causing the rotation of counting wheel **222** in the first direction. This rotation is caused by the linear force of protrusion **218** of actuator **217** acting on at least one actuation feature **232**. It is contemplated that after protrusion **218** engages the plurality of actuation features **232** of actuation wheel **228**, actuator **217** will continue to translate to the distal position. Upon release of trigger **18**, actuator **217** returns to the proximal position. While returning to the proximal position, actuator **217** engages with at least one of actuation features **232** causing that actuation feature **232** to flex thereby inhibiting rotation of counting wheel **222** in a direction opposite of the first direction.

As described above, actuation wheel **228** is configured for unidirectional rotation. The cooperation of the plurality of inner fingers **234** of actuation wheel **228** and the plurality of locking teeth **210** of stationary post **208** and the flexing of the plurality of actuation features **232** prohibits rotation of counting mechanism **220** during the translation of protrusion **218** of actuator **217** from the distal position to the proximal position, for example, a secondary direction opposite to the first direction.

FIG. **4**B illustrates another embodiment of an actuator in accordance with the present disclosure, and is generally designated by **217'**. In this embodiment, actuator **217'** includes a proximal end **217***a'* configured and dimensioned to engage with counter assembly **200**. Proximal end **217***a'* is configured for engagement with the plurality of actuation features **232'** of actuation wheel **228'**.

Actuator **217'** translates linearly between a proximal position and a distal position. While actuator **217'** is positioned in the proximal position, the proximal end **217***a'* of the

actuator **217'** is engaged with at least one of the actuation features **232'** of actuation wheel **228'**. In the distal position, proximal end **217***a'* of actuator **217'** is disengaged from the plurality of actuation features **232'** of actuation wheel **228'**.

As shown in FIG. **4**B, upon return from the distal position to the proximal position actuator **217'** engages with at least one of the actuation features **232'** of actuation wheel **228'** at point "A." Actuator **217'** continues to translate past point "A" forcing counting wheel **222** to rotate. Once actuator **217'** reaches point "B," proximal end **217***a'* of actuator **217'** has reached the proximal position. Upon firing clip applier **10**, actuator **217'** transitions from the proximal position to the distal position. At point "B," at least one of the actuation features **232'** will flex away from actuator **217'** avoiding engagement of the at least one actuation **232'** and actuator **217'**. It is contemplated that actuator **217'** will also flex/deflect against the surface of actuation wheel **228'** when the actuator **217'** is transitioning from the proximal position to the distal position. Additionally, when the engaged actuation feature **232'** of actuation wheel **228'** has rotated from point "A" to point "B," indicia **224** will be adjusted to reflect either the remaining number of surgical clip or the number of fired surgical clips.

As mentioned above, counting wheel **222** is configured for unidirectional rotation. The cooperation of the plurality of inner fingers **234'** of actuation wheel **228'** and the plurality of locking teeth **210'** of stationary post **208'** and the flexing of the plurality of actuation features **232'** prohibits rotation of counting wheel **222** during the translation of proximal end **217***a'* of actuator **217'** from the proximal position to the distal position.

Referring back to FIG. **2**, as noted above, handle assembly **12** is provided with a counter window **24** at a proximal end thereof which may reveal counter assembly **200** associated therewith. Window **215** of counter assembly **200** aligns with counter window **24** such that user may view indicia **224** during use of clip applier **10**. As mentioned above, actuator **217** causes the rotation of counter assembly **200** by using the linear force created by the transition of the rack bar **26** and actuator **217**.

It should be understood that the forgoing description is only illustrative of the present clip applier and counter assembly. Various alternatives and modifications can be devised by those skilled in the art without departing from the disclosure. Accordingly, the present disclosure is intended to embrace all such alternatives, modifications, and variances. The embodiments described with reference to the attached drawings are presented only to demonstrate certain examples of the clip applier and counter assembly. Other elements, steps, methods, and techniques that are insubstantially different from those described above and/or in the appended claims are also intended to be within the scope of the disclosure.

What is claimed is:

1. A surgical clip applier, comprising:

a handle assembly;

an elongated tubular member extending distally from the handle assembly;

a rack bar translatably supported in the handle assembly;

a counter assembly supported in the handle assembly, the counter assembly including:

a housing including a first housing half and a second housing half;

a stationary post positioned within the first housing half and including a plurality of locking teeth;

a counting wheel positioned to rotate within the housing, the counting wheel including indicia visible through the handle assembly;

an actuation wheel including a plurality of actuation features and a plurality of inner fingers configured to selectively engage with the plurality of locking teeth of the stationary post, wherein the engagement of the plurality of inner fingers of the actuation wheel and the plurality of locking teeth of the stationary post prohibit multidirectional rotation of the counting wheel; and

an actuator supported on the rack bar for translation therewith, the actuator including a protrusion projecting therefrom, the actuator positioned to translate between a proximal position and a distal position, wherein transitioning between the proximal position and the distal position, the protrusion of the actuator engages the plurality of actuation features to rotate the counting wheel to adjust the indicia of the counting wheel.

2. The surgical clip applier of claim **1**, wherein the first housing half defines a linear channel and includes at least one translation pin positioned within the linear channel.

3. The surgical clip applier of claim **2**, wherein the actuator is configured to translate within the linear channel of the first housing half and defines at least one channel configured to receive the at least one translation pin.

4. The surgical clip applier of claim **1**, wherein the first housing half further defines a first recess and a second recess, wherein the first recess is configured to receive the actuation wheel and the counting wheel and the second recess is configured to receive a first side of the actuation wheel.

5. The surgical clip applier of claim **4**, wherein the stationary post is concentrically positioned within the first housing half in relation to the first recess and the second recess.

6. The surgical clip applier of claim **4**, wherein the second recess of the first housing half prevents disconnection between the plurality of inner fingers of the actuation wheel and the plurality of locking teeth of the stationary post.

7. The surgical clip applier of claim **1**, wherein the second housing half defines an aperture configured to receive the counting wheel.

8. The surgical clip applier of claim **1**, wherein the actuation wheel includes a plurality of protrusions and the counting wheel defines a plurality of grooves, wherein the plurality of grooves is configured to receive the plurality of protrusions such that the actuation wheel and the counting wheel are coupled together.

9. The surgical clip applier of claim **1**, wherein each inner finger of the plurality of inner fingers is resilient and flexible, and extends in a substantially tangential direction to an inner surface of the actuation wheel.

10. The surgical clip applier of claim **9**, wherein the substantially tangential direction of each inner finger of the plurality of inner fingers prohibits multidirectional rotation of the counting wheel.

11. The surgical clip applier of claim **1**, wherein each actuation feature of the plurality actuation features is resilient and flexible, and extends in a substantially tangential direction to an outer surface of the actuation wheel.

12. The surgical clip applier of claim **11**, wherein the plurality of actuation features is configured to flex away from the actuator when the actuator is translating from the distal position to the proximal position.

13. The surgical clip applier of claim 11, wherein the plurality of actuation features is configured to flex away from the actuator when the actuator is translating from the proximal position to the distal position.

14. The surgical clip applier of claim 1, further including a plurality of surgical clips disposed within the elongated tubular member, wherein the indicia of the counting wheel indicate a remaining number of the plurality of surgical clips.

15. The surgical clip applier of claim 14, wherein a number of actuation features of the plurality of actuation features is equal to an initial number of surgical clips of the plurality of surgical clips.

16. The surgical clip applier of claim 14, wherein the indicia include a plurality of numbers to indicate the remaining number of surgical clips of the plurality of surgical clips.

17. The surgical clip applier of claim 14, wherein the indicia include a color to indicate the remaining number of surgical clips of the plurality of surgical clips.

18. The surgical clip applier of claim 1, wherein the housing defines a window therethrough which the indicia of the counting wheel are visible during the use of the surgical clip applier.

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